

the advantages deriving from the presence of the dehydrating agents become particularly evident when relatively high extrusion temperatures, generally above 180°C, preferably above 200°C, are used.

5 In addition, the Applicant has found that the effect of the dehydrating agent on the surface appearance and on the mechanical properties of the flame-retardant coating is particularly evident when flame-retardant fillers of natural origin are used, for
10 example magnesium hydroxide obtained by grinding minerals such as brucite and the like. The reason for this is thought to be that a flame-retardant filler of natural origin contains large amounts of moisture, greater than the amounts typically found in synthetic
15 flame-retardant fillers. The moisture present can derive either from the starting mineral or from the grinding process to which this mineral is subjected, or can be absorbed from the surroundings.

Dehydrating agents which can be used are readily
20 available inorganic compounds which are easy to handle, which do not adversely effect the mechanism of action of the flame-retardant filler and which do not produce toxic products if they are heated to high temperature or exposed to the direct action of a flame. In particular,
25 the dehydrating agent can be chosen from: calcium oxide, calcium chloride, anhydrous alumina, zeolites, magnesium sulphate, magnesium oxide, barium oxide and the like, or mixtures thereof. Calcium oxide and zeolites, or mixtures thereof, are particularly preferred.

30 The amount of dehydrating agent to be added to the flame-retardant composition is mainly predetermined as a function of the nature and efficacy of this agent and on the amount of water present in the flame-retardant filler. In general, it is believed that an
35 amount of dehydrating agent of between 0.5 and 15 % by weight, preferably between 1 and 10 % by weight,

relative to the weight of the flame-retardant filler, is sufficient to ensure a satisfactory result.

Flame-retardant fillers which can generally be used are hydroxides, hydrated oxides, salts or hydrated salts of metals, in particular of calcium, aluminium or magnesium, such as: magnesium hydroxide, alumina trihydrate, hydrated magnesium carbonate, magnesium carbonate, hydrated calcium and magnesium carbonate, calcium and magnesium carbonate, or mixtures thereof. Magnesium hydroxide is particularly preferred, since it is characterized by a decomposition temperature of about 340°C and thus allows high extrusion temperatures to be used. It is more particularly preferred to use magnesium hydroxide of natural origin, obtained by grinding minerals based on magnesium hydroxide, such as brucite or the like, as described in European patent application No. 97121042.2, filed on 01.12.97 by the Applicant and in the publication on Research Disclosure No. 407 (March 1998).

The flame-retardant filler is generally used in the form of particles which are untreated or surface-treated with saturated or unsaturated fatty acids containing from 8 to 24 carbon atoms, or metal salts thereof, such as, for example: oleic acid, palmitic acid, stearic acid, isostearic acid, lauric acid; magnesium or zinc stearate or oleate; and the like. In order to increase the compatibility with the polymer matrix, the flame-retardant filler can likewise be surface-treated with suitable coupling agents, for example organic silanes or titanates such as vinyltriethoxysilane, vinyltriacetylsilane, tetraisopropyl titanate, tetra-n-butyl titanate and the like.

The amount of flame-retardant filler to be added is predetermined so as to obtain a cable which is capable of passing the ordinary fire-resistance tests, for example the test according to standards IEC 332-1 and IEC 332.3 A,B,C. In general, this amount is between

10 and 90 % by weight, preferably between 30 and 80 % by weight, relative to the total weight of the flame-retardant composition.

The polymer base can generally be chosen from:
5 polyolefins, various olefin copolymers, copolymers of olefins with ethylenically unsaturated esters, polyesters, polyethers, polyether/polyester copolymers, and mixtures thereof.

Examples of such polymers are: high-density
10 polyethylene (HDPE) ($d=0.940-0.970 \text{ g/cm}^3$), medium-density polyethylene (MDPE) ($d=0.926-0.940 \text{ g/cm}^3$), low-density polyethylene (LDPE) ($d=0.910-0.926 \text{ g/cm}^3$);
15 copolymers of ethylene with α -olefins containing from 3 to 12 carbon atoms (for example 1-butene, 1-hexene, 1-octene and the like), in particular linear low-density polyethylene (LLDPE) and ultra-low-density polyethylene (ULDPE) ($d=0.860-0.910 \text{ g/cm}^3$); polypropylene (PP);
thermoplastic copolymers of propylene with another olefin, in particular ethylene; copolymers of ethylene
20 with at least one ester chosen from alkyl acrylates, alkyl methacrylates and vinyl carboxylates, in which the linear or branched alkyl group can contain from 1 to 8, preferably from 1 to 4, carbon atoms, while the linear or branched carboxylic group can contain from 2 to 8,
25 preferably from 2 to 5, carbon atoms, in particular ethylene/vinyl acetate (EVA) copolymers; ethylene/ethyl acrylate (EEA) copolymers, ethylene/butyl acrylate (EBA) copolymers; ethylene/ α -olefin rubbers, in particular ethylene/propylene rubbers (EPR),
30 ethylene/propylene/diene rubbers (EPDM); natural rubber; butyl rubbers; and mixtures thereof.

Copolymers which are particularly preferred are those which can be obtained by copolymerization of
35 ethylene with at least one α -olefin containing from 3 to 12 carbon atoms, and optionally with a diene, in the presence of a "single-site" catalyst, in particular a metallocene catalyst or a constrained geometry catalyst.